

BMTRY 763

Fitting CAR Models: CARBayes

CAR models are those that include a CAR component ie *Conditional Autoregressive* component. This component can be used to model the spatial correlation in the dataset. An example of this kind of model is:

$$y_i \sim \text{Pois}(e_i \theta_i)$$

$$\log(\theta_i) = \alpha + v_i + u_i$$

$$v_i \sim N(0, \tau_v^{-1})$$

$$u_i | \sim N(\bar{u}_{\delta_i}, \tau_u^{-1} / n_{\delta_i})$$

On Homeroom

Correlated Heterogeneity in WinBUGS.pdf is available for you to read.

There are a range of files (WinBUGS ODCs) on Homeroom for you to examine and run

Log_linear_UH_SC_congen_abnor.odc

Congen_abnor_SC_gamma_poisson.odc

CAR_normal_congen_abnor_SC.odc

They are in correlated_Hfiles.zip

- 1) Describe the models specified in the three files using model notation
(eg $y_i \sim \dots$)
- 2) Using CARBayes: compare the model fits using DIC, WAIC and MPL
- 3) Compare the available GOF measures in WinBUGS /OpenBUGS for the relevant model.
- 4) For the 'best' model obtain a posterior median relative risk map, and a map of the posterior mean standardized residuals.